What is claimed is:

1. A method for preventing or treating an amyloid-related disease in a subject, comprising: administering to the subject an antigenic amount of an all-D peptide, wherein said all-D peptide elicits the production of antibodies against said all-D peptide and induces an immune response by said subject, thereby preventing or reducing amyloid-induced cellular toxicity or amyloid fibril formation.

2. A method for preventing or treating an amyloid-related disease in a subject, comprising: administering to the subject an antigenic amount of an all-D peptide, wherein said all-D peptide elicits the production of antibodies against said all-D peptide and induces an immune response by said subject, thereby preventing or reducing amyloid-induced cellular toxicity or amyloid fibril formation.

3. The method of claim 1, wherein said all-D peptide interacts with at least one region of an amyloid protein, said region being selected from the group consisting of: C-terminal region, β sheet region, GAG-binding site region, macrophage adherence region, immunogenic fragments thereof, protein conjugates thereof, immunogenic derivative peptides thereof, immunogenic peptides thereof, and immunogenic peptidomimetics thereof.

4. The method of claim 3, wherein said all-D peptide further comprises:

(a) an N-terminal substituent selected from the group consisting of:

hydrogen;

lower alkyl group consisting of acyclic or cyclic having 1 to 8 carbon atoms;

aromatic group;

heterocyclic group; and

acyl group; and

(b) a C-terminal substituent selected from the group consisting of hydroxy, alkoxy, aryloxy, unsubstituted and substituted amino groups.

5. The method of claim 4, wherein said alkyl or aromatic group is further substituted with a group selected from the group consisting of halide, hydroxyl, alkoxyl, aryloxyl, hydroxycarbonyl, alkoxylcarbonyl, aryloxycarbonyl, carbamyl, unsubstituted amino, substituted amino, sulfo, alkyloxysulfonyl, phosphono and alkoxyphosphonyl groups.

6. The method of claim 1, wherein said all-D peptide further comprises an acid functional group, or a pharmaceutically acceptable salt or ester form thereof.

7. The method of claim 3, wherein said all-D peptide further comprises a base functional group, or a pharmaceutically acceptable salt form thereof.

8. The method of claim 4, wherein said all-D peptide is selected from the group consisting of SEQ ID NOS: 1-50.

9. The method of claim 8, wherein said all-D peptide is modified by substituting at least one amino acid residue with another amino acid or non-amino acid fragment.

10. The method of claim 9, wherein said modified peptide is selected from the group consisting of SEQ ID NOS: 49-65.

11. The method of claim 8, wherein said all-D peptide is modified by removing or inserting at least one amino acid residue.

12. A method for preventing or treating an amyloid-related disease in a subject, comprising:

administering to the subject an antigenic amount of a peptide having Formula I:

R'—(P)—R" (I)

wherein

P is an all-D peptide that interacts with at least one region of an amyloid protein selected from the group consisting of: C-terminal region, β sheet region, GAG-binding site region, macrophage adherence region, immunogenic fragments thereof, protein conjugates thereof, immunogenic derivative peptides thereof, immunogenic peptides thereof, and immunogenic peptidomimetics thereof;

R' is an N-terminal substituent selected from the group consisting of:

hydrogen;

lower alkyl group consisting of acyclic or cyclic having 1 to 8 carbon atoms;

aromatic group;

heterocyclic group; and

acyl group; and

R" is a C-terminal substituent selected from the group consisting of hydroxy group, alkoxy group, aryloxy group, unsubstituted group, and substituted amino group.

13. The method of claim 11, wherein said all-D peptide elicits the production of antibodies against said all-D peptide, and induces an immune response by said subject, thereby preventing or reducing amyloid-induced cellular toxicity or amyloid fibril formation.

14. The method of claim 11, wherein said alkyl or aromatic group is further substituted with a group selected from the group consisting of halide, hydroxyl, alkoxyl, aryloxyl, hydroxycarbonyl, alkoxylcarbonyl, aryloxycarbonyl, carbamyl, unsubstituted amino, substituted amino, sulfo, alkyloxysulfonyl, phosphono and alkoxyphosphonyl groups.

15. The method of claim 11, wherein said all-D peptide further comprises an acid functional group, or a pharmaceutically acceptable salt or ester form thereof.

16. The method of claim 11, wherein said all-D peptide further comprises a base functional group, or pharmaceutically acceptable salt form thereof.

17. The method of claim 11, wherein said all-D peptide is selected from the group consisting of SEQ ID NOS: 1-50.

18. The method of claim 17, wherein said all-D peptide is modified by substituting one or more amino acid residues with other amino acid or non-amino acid fragment.

19. The method of claim 18, wherein said modified peptide is selected from the group consisting of SEQ ID NOS: 51-65.

20. The method of claim 17, wherein said all-D peptide is modified by removing or inserting one or more amino acid residues.

21. A composition for preventing or treating an amyloid-related disease in a subject, comprising an antigenic amount of an all-D peptide, wherein said all-D peptide elicits the production of antibodies against said all-D peptide, and induces an immune response by said subject, thereby preventing or reducing amyloid-induced cellular toxicity or amyloid fibril formation.

22. The composition of claim 21, said all-D peptide interacts with at least one region of an amyloid protein, said region being selected from the group consisting of: C-terminal region, β sheet region, GAG-binding site region, macrophage adherence region, immunogenic fragments thereof, protein conjugates thereof, immunogenic derivative peptides thereof, immunogenic peptides thereof, and immunogenic peptidomimetics thereof.

23. The composition of claim 21, wherein said all-D peptide further comprises:

(a) an N-terminal substituent selected from the group consisting of:

hydrogen;

lower alkyl group consisting of acyclic or cyclic having 1 to 8 carbon atoms;

aromatic group;

heterocyclic group; and

acyl group; and

(b) a C-terminal substituent selected from the group consisting of hydroxy, alkoxy, aryloxy, unsubstituted and substituted amino group.

24. The composition of claim 23, wherein said alkyl or aromatic group is further substituted with a group selected from the group consisting of halide, hydroxyl, alkoxyl, aryloxyl, hydroxycarbonyl, alkoxylcarbonyl, aryloxycarbonyl, carbamyl, unsubstituted amino, substituted amino, sulfo, alkyloxysulfonyl, phosphono and alkoxyphosphonyl groups.

25. The composition of claim 24, wherein said all-D peptide further comprises an acid functional group, or a pharmaceutically acceptable salt or ester form thereof.

26. The composition of claim 23, wherein said all-D peptide further comprises a base functional group, or a pharmaceutically acceptable salt form thereof.

27. The composition of claim 23, wherein said all-D peptide is selected from the group consisting of SEQ ID NOS: 1-50.

28. The composition of claim 27, wherein said all-D peptide is modified by substituting at least one amino acid residue with another amino acid or non-amino acid fragment.

29. The composition of claim 28, wherein said modified peptide is selected from the group consisting of SEQ ID NOS: 51-65.

30. The composition of claim 27, wherein said all-D peptide is modified by removing or inserting at least one amino acid residue.

31. A composition for preventing or treating an amyloid-related disease in a subject, comprising an antigenic amount of a peptide having Formula I:

$$R'—(P)—R'' \qquad (I)$$

wherein

P is an all-D peptide that interacts with at least one region of an amyloid protein selected from the group consisting of: C-terminal region, β sheet region, GAG-binding site region, macrophage adherence region, immunogenic fragments thereof, protein conjugates thereof, immunogenic derivative peptides thereof, immunogenic peptides thereof, and immunogenic peptidomimetics thereof;

R' is an N-terminal substituent selected from the group consisting of:

hydrogen;

lower alkyl group consisting of acyclic or cyclic having 1 to 8 carbon atoms;

aromatic group;

heterocyclic group; and

acyl group; and

R" is a C-terminal substituent selected from the group consisting of hydroxy group, alkoxy group, aryloxy group, unsubstituted group, and substituted amino group.

32. The composition of claim 31, wherein said all-D peptide elicits the production of antibodies against said all-D peptide, and induces an immune response by said subject, thereby preventing or reducing amyloid-induced cellular toxicity or amyloid fibril formation.

33. The composition of claim 31, wherein said alkyl or aromatic group is further substituted with a group selected from the group consisting of halide, hydroxyl, alkoxyl, aryloxyl, hydroxycarbonyl, alkoxylcarbonyl, aryloxycarbonyl, carbamyl, unsubstituted amino, substituted amino, sulfo, alkyloxysulfonyl, phosphono and alkoxyphosphonyl groups.

34. The composition of claim 31, wherein said all-D peptide further comprises an acid functional group, or a pharmaceutically acceptable salt or ester form thereof.

35. The composition of claim 31, wherein said all-D peptide further comprises a base functional group, or pharmaceutically acceptable salt form thereof.

36. The composition of claim 31, wherein said all-D peptide is selected from the group consisting of SEQ ID NOS: 1-50.

37. The composition of claim 36, wherein said all-D peptide is modified by substituting one or more amino acid residues with other amino acid or non-amino acid fragment.

38. The composition of claim 37, wherein said modified peptide is selected from the group consisting of SEQ ID NOS: 51-65.

39. The composition of claim 36, wherein said all-D peptide is modified by removing or inserting one or more amino acid residues.